ES-97

What is claimed is:

1. A battery element useful as a negative plate in a lead acid battery comprising a separator, positive and negative active material, sulfuric acid electrolyte and an acid resistant metal impurity inhibiting amount of micronized porous organic polymer particles having an average particle size distribution less than 3 microns and functional groups on the internal surfaces of the porous particles which have a preferential affinity over lead ion for at least one electrolyte soluble metal cation impurity ion more nobler than lead at the discharge charge electrochemical and sulfuric acid molarity conditions of the battery provided that the metal cation impurity ion is not detrimentally desorbed or released under said conditions, soluble lead ion has a reduced affinity for bonding with the functional groups and further said organic porous polymer is associated with said negative active material and in contact with the metal impurity ion containing electrolyte to allow said ion to permeate the internal surface of the porous polymer.

2. The element of Claim 1 wherein the organic polymer has acid functionality.

3. The element of Claim 2 wherein the acid functionality is aminophosphonic.

4. The element of Claim 1 wherein the organic polymer has thiouronium functionality.

5. The element of Claim 3 wherein the organic polymer is a cross-linked polystyrene and the cross-linking is by divinylbenzene.

6. The element of Claim 4 wherein the organic polymer is a cross-linked polystyrene and the cross-linking is by divinylbenzene.

7. The element of Claim 3 wherein the metal impurity is selected from the group consisting of antimony and iron.

8. The element of Claim 4 wherein the metal impurity is silver.

9. The element of Claim 1 wherein the average particle size is less than one micron.

10. The element of Claim 3 wherein the average particle size is less than one micron.

11. A battery element useful as a negative plate in a lead acid battery comprising a separator, positive and negative active material, sulfuric acid electrolyte and an acid resistant metal impurity inhibiting amount of micronized porous organic polymer particles having an average particle size distribution less than 3 microns and functional groups on the internal surfaces of the porous particles which have a preferential affinity over lead ion for at least one electrolyte soluble metal cation impurity ion more nobler than lead at the discharge charge electrochemical and sulfuric acid molarity conditions of the battery provided that the metal cation impurity ion is not detrimentally desorbed or released under said conditions, soluble lead ion has a reduced affinity for bonding with the functional groups and said organic porous polymer is associated with the internal porosity of macroporous particles having an average particle size distribution less than 25 microns and a pore size distribution which allows for a plurality of organic polymer particles to be associated with the internal porosity of said macroporous particles and said micronized organic polymer particles and

macroporous particles are associated with said negative active material and in contact with the metal impurity ion to allow said ion to permeate the internal surface of the porous polymer.

12. The element of Claim 11 wherein the organic polymer has acid functionality.

13. The element of Claim 12 wherein the acid functionality is aminophosphonic.

14. The element of Claim 11 wherein the organic polymer has thiouronium functionality.

15. The element of Claim 12 wherein the organic polymer is a cross-linked polystyrene and the cross-linking is by divinylbenzene.

16. The element of Claim 13 wherein the organic polymer is a cross-linked polystyrene and the cross-linking is by divinylbenzene.

17. The element of Claim 13 wherein the metal impurity is selected from the group consisting of antimony and iron.

18. The element of Claim 14 wherein the metal impurity is silver.

19. The element of Claim 11 wherein the average particle size is less than one micron.

20. The element of Claim 13 wherein the average particle size is less than one micron.

21. A battery element useful as a negative plate in a lead acid battery comprising a separator, positive and negative active material, sulfuric acid electrolyte and an acid resistant metal impurity inhibiting amount of micronized porous organic polymer particles having an average particle size distribution less than 3 microns and functional groups on the internal surfaces of the porous particles which have a preferential affinity over lead ion

for at least one electrolyte soluble metal cation impurity ion more nobler than lead at the discharge charge electrochemical and sulfuric acid molarity conditions of the battery provided that the metal cation impurity ion is not detrimentally desorbed or released from the functional groups under said conditions, soluble lead ion has a reduced affinity for bonding with the functional groups and said organic porous polymer is associated with the internal porosity of the macroporous particles through a cationic linking polymer, said particles having an average particle size distribution on a number basis less than 25 microns and a pore size distribution which allow for a plurality of organic polymer particles to be associated with the internal porosity of said macroporous particles and said micronized organic polymer particles and macroporous particles are associated with said negative active material and in contact with the metal impurity ion containing electrolyte to allow said ion to permeate the internal surface of the porous polymer.

22. The element of Claim 21 wherein the organic polymer has acid functionality.

23. The element of Claim 22 wherein the acid functionality is amino phosphonic.

24. The element of Claim 21 wherein the organic polymer has thiouronium functionality.

25. The element of Claim 22 wherein the organic polymer is a cross-linked polystyrene and the cross-linking is by divinylbenzene.

26. The element of Claim 24 wherein the organic polymer is a cross-linked polystyrene and the cross-linking is by divinylbenzene.

27. The element of Claim 23 wherein the metal impurity is selected from the group consisting of antimony and iron.

28. The element of Claim 24 wherein the metal impurity is silver.

29. The element of Claim 21 wherein the average particle size is less than one micron.

30. The element of Claim 23 wherein the average particle size is less than one micron.